California Marine Life Protection Act Initiative
Master Plan Science Advisory Team
Executive Summary – SAT Central Coast MPA Proposal Evaluations
March 10, 2006

The MLPA Master Plan Science Advisory Team (SAT) analyzed the relative merits of the six proposed central coast marine protected area (MPA) packages (0, 1, 2, 3, S, AC) in meeting the SAT guidelines and science-related goals (1, 2, 3, 4 and 6) of the Marine Life Protection Act (MLPA). Those analyses were discussed, refined and approved by members of the SAT members present at the January 20, 2006 and March 2, 2006 SAT meetings in San Jose.

Subsequent to that meeting, a draft executive summary was prepared by several SAT members and that draft refined in several iterations. A majority of the SAT members expressed support for the resulting document. One SAT member expressed concerns about the recommendations regarding size and spacing and the development of analyses by the evaluation sub team, and so agrees that the executive summary accurately reports the analyses, but cannot endorse the executive summary.

Table 1: Scientific Elements Used to Evaluate MLPA Science-Related Goals

MLPA goal	SAT evaluation of scientific elements
1. To protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems.	Habitats and protection levels
2. To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.	Size, spacing and protection levels
3. To improve recreational, educational, and study opportunities provided by marine ecosystems that are subjected to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.	Habitat replication
4. To protect marine natural heritage, including protection of representative and unique marine life habitats in California.	Habitats and protection levels
5. To ensure that California's MPAs have clearly defined objectives, effective management measures and adequate enforcement and are based on sound scientific guidelines.	No SAT evaluation specific to Goal 5
6. To ensure that the states' MPAs are designed and managed, to the extent possible, as a network.	Size and spacing guidelines

Based on these analyses, the SAT drew these conclusions:

SAT Guidelines and Area Protected by MPAs

Helping to sustain populations through the use of MPAs depends on population size, the spatial distribution of MPAs, the magnitude of fishing pressure outside the MPAs, extent of

adult movement and the dispersal distance of larvae. To help sustain a variety of populations and, by extension communities and ecosystems, the SAT chose MPA size and spacing guidelines that were judged to be adequate. As such, the MLPA Master Plan Framework (MPF) guidelines of MPA size and spacing provide a method for evaluating the proposed MPA packages. With regard to helping to sustain populations, the SAT recommended that MPAs should extend from the shoreline to deep water (i.e., offshore boundary of state waters) and should be a minimum of 3-6 miles along the coast, and preferably 6-12 miles in length. These size guidelines were recommended to include the typical range of movements of many species living in state waters. The maximum spacing guideline of 30-60 miles was based on the dispersal distances of larvae of many species.

The size and spacing guidelines are not independent of one another. The SAT recommended that if proponents choose to propose smaller MPAs, then those MPAs should be spaced closer together (at the lower end of the proposed spacing guideline). Conversely, consistently larger MPAs could be situated at the larger end of the spacing guideline.

Because there are many possible combinations of size and spacing, the SAT provides the following guidance to the MLPA Blue Ribbon Task Force (BRTF) with respect to the amount of area needed to be protected to meet the MLPA goals:

- The minimum size guideline (3 miles long) combined with the minimum spacing guideline (30 miles apart) suggests that at a minimum, MPAs should cover at least 9% of each habitat in the study area (i.e., 3 mi/33 mi).
- The maximum of the preferred size guideline (12 miles) combined with the lower value of the maximum spacing guideline (30 miles) suggests that MPAs covering up to 29% of each habitat in the study area bound the preferred range of SAT guidelines (i.e., 12 mi/42 mi).

Using these benchmarks, we examined which habitats were included at the 10%, 20% (i.e., midpoint), and 30% levels for each package.

General Comments on All Packages (without consideration of existing kelp harvest leases)

How packages are similar:

1. All packages have increased conservation benefits and have created substantially better ecological MPA networks relative to existing MPAs (Package 0).
2. All packages meet the minimum MPF guidelines for MPA spacing for the majority of habitats even when only high-protection MPAs are considered.
3. Most MPAs in all packages meet the MPF guidelines for shoreline length even when only high-protection MPAs are considered.
4. With respect to habitat replication, all packages include at least two MPAs that meet the MPF area or shoreline length guidelines for each of the following habitat types: sandy beach, rocky intertidal, surfgrass/eelgrass, shallow sand, deep sand, shallow rock, kelp, and upwelling centers.

How packages differ:

5. The packages differ substantially in the amount of area protected, the level of protection in each habitat type, and the number of MPAs in the MPF preferred size range.
6. With respect to the amount of area receiving any protection and to the amount of area receiving high protection (SMR & SMCA-high), the packages are ordered in the following manner: Package 1 (least protection), Package 3, Package S, Package 2, and Package AC (most protection).
7. Packages 2, 3, AC and S have a strong majority of high protection MPAs that meet MPF guidelines for area or shoreline length. A majority of high protection MPAs in Package 1 are smaller than MPF guidelines for area.
8. The diversity of habitats is protected at high levels in a substantially larger number of MPAs that meet MPF area guidelines in Packages 2, 3, AC and S than in Package 1.
9. Packages 2 and S meet the MPF spacing guidelines for all habitats protected at high levels, whereas packages 1 and 3 have a gap between MPAs in one habitat that exceeds MPF guidelines*, and Package AC has two gaps that exceed MPF guidelines. (*the gaps in packages 1 & 3 reflect miscommunications between the SAT and package proponents, and can be rectified)

Specific Comments on All Packages (without consideration of existing kelp harvest leases)

Moderate to High Level of Protection across All Packages

10. All packages protect at least 10% of each habitat type at the moderate-to-high protection levels across the study region, with the exception of shallow canyon habitat in Package 1 (5% protected).
11. All packages provide moderate-to-high level protection to at least 20% of five habitats: deep rock, deep sand, deep canyon, rocky intertidal and estuarine habitats.
12. No package protects 30% or more of all habitats at the moderate-to-high levels. However, packages 2, AC and S protect more habitat types at these protection levels than packages 1 and 3.

High Level of Protection across All Packages (SMR or SMCA-High MPAs)

13. All packages provide high-level protection for at least 20% of rocky intertidal habitat.
14. All packages provide high-level protection for at least 30% of estuarine habitat.
15. In packages 2, 3, AC and S, at least half of the high protection MPAs meet or exceed the minimum MPF guidelines.
16. In general, considering all habitat types, packages 2 and AC provide the greatest amounts of high-level protection, followed by packages 3 and S, and lastly by Package 1.

Highest Level of Protection across All Packages (SMR)

17. Only packages 2 and AC provide the highest level of protection to at least 10% of all habitat types, excluding shallow canyon habitat.
18. All packages provide the highest level of protection to at least 10% of four habitats: sandy beach, kelp, rocky intertidal, and estuaries.
19. All packages provide the highest level of protection to at least 20% of rocky intertidal and estuarine habitats.
20. In general, all the packages provide the least amount of highest level of protection to deep rock, deep sand, and shallow sand habitats.

Other Comments to Specific Packages

Package 1

- Provides moderate-to-high level protection for at least 20% of five habitats.
- Provides high-level protection for at least 20% of four habitats: rocky intertidal, estuaries, deep canyon, and deep sand.
- Provides high-level protection for at least 30% of only one habitat: estuaries.
- When high protection MPAs are considered, Package 1 has a smaller fraction of MPAs that meet MPF guidelines than the other packages.
- SMRs include less than 1% of available deep rock habitat.

Package 2

- Provides moderate-to-high level protection for at least 20% of eight habitats.
- Provides high-level protection for at least 20% of six habitats: rocky intertidal, estuaries, deep rock, shallow rock, kelp, and sandy beach.
- Provides high-level protection for close to 30% (or greater) of four habitats: shallow rock, rocky intertidal, estuaries, and kelp.

Package 3

- Provides moderate-to-high level protection for at least 20% of eight habitats.
- Provides high-level protection for at least 20% of five habitats: shallow rock, rocky intertidal, kelp, sandy beach, and estuaries.
- Provides high-level protection for at least 30% of one habitat: estuaries.
- SMRs are proposed for less than 1% of available deep rock habitat.

Package AC

- Provides moderate-to-high level protection for at least 20% of all habitats.
- Provides moderate-to-high level protection for at least 30% of seven habitats.
- Provides high-level protection for at least 20% of six habitats: rocky intertidal, estuaries, shallow rock, shallow sand, kelp, and sandy beach.
- Provides high-level protection for at least 30% of four habitats: rocky intertidal, estuaries, shallow rock, and kelp.

Package S

- Provides moderate-to-high level protection for at least 20% of eight habitats.
- Provides moderate-to-high level protection for at least 30% of four habitats.
- Provides high-level protection for at least 20% of seven habitats: rocky intertidal, estuaries, deep rock, deep canyon, shallow rock, sandy beach, and kelp.
- Provides high-level protection for at least 30% of two habitats: estuaries and rocky intertidal.
- SMRs are proposed for less than 3% of available deep rock habitat.

Summary of Potential Impacts to Commercial and Recreational Fisheries in the Central Coast Study Region

Each package also was analyzed for impacts on 19 commercial fisheries and 2 important recreational fisheries (i.e., salmon and rockfish). There are several patterns that emerge from the analysis of the 5 proposed MPA packages (excluding Package 0):

A. All packages affect the 19 commercial fisheries differently, with the smallest effects in terms of both value (equivalent to "stated importance") and area affected evidenced in Package 1 in the majority of fisheries studied.

B. In the commercial fisheries, for 16 out of the 19 species investigated, Package 1 has the least effects within the study region and Package AC the most, packages S and 3 lie between packages 1 and 2 in 12 of the 19 fisheries.

C. There are some deviations from this pattern in terms of the relative value of the affected areas, i.e., larger areas affected do not always correspond to higher stated importance affected.

D. In the commercial fishery, for 18 out of the 19 species investigated, Package 1 has the least effects on the relative value and Package AC the most, packages S and 3 lie between packages 1 and 2 in 11 of the 19 fisheries.

E. Package S has the least impact within the study region for 2 of the fisheries, anchovy and white seabass, with comparable impacts to Package 1 for 8 of the fisheries, (anchovy, halibut, mackerel, salmon, sardine, white seabass, and squid);

F. Package S has less than 10% impact on the value within the study area for 8 of the 19 commercial fisheries, compared to 12 for Package 1, 7 for Package 3, 2 for Package 2 (5 additional fisheries for Package 2 are between 10% - 11%), and 1 for Package AC.

G. Packages have similar effects on the 2 recreational fisheries considered, with the package that affects the smallest area of grounds being the one that affects the least number of trips.

H. Package 1 followed by Package S affects the least amount of recreational fishing area and trips for both salmon and rockfish, with Package 2 having the largest effect on the recreational fishing area and number of trips for salmon, while packages AC and 3 have the largest effect on the recreational fishing area and number of trips for rockfish.

Summary of Non-Consumptive Economic Impacts

Each package was qualitatively analyzed for non-consumptive impacts. The following general observations can be drawn:

I. Compared to the status quo (Package 0), all of the proposed packages provide increased protection and enhancement of non-consumptive use values in the central coast.

J. Throughout the region, packages 2, 3, S and AC generally provide substantial protection and enhancement for non-consumptive uses. The proposals, however, are likely to differ considerably in the magnitude of improvement and protection in specific areas (e.g. the Monterey Bay area).

K. For non-consumptive uses, four areas could be considered to be centers of intensive non-consumptive use: a) Elkhorn Slough (primarily for kayaking and wildlife viewing) and b) south Monterey Bay, the Pinnacles near Carmel Point, and Point Lobos (for diving and kayaking).

L. All of the packages provide high levels of protection to Elkhorn Slough and the Point Lobos area, but the packages differ substantially in the degree to which non-consumptive uses are likely to be protected or enhanced in the vicinity of south Monterey Bay and the Pinnacles.

M. For the south Monterey Bay dive areas associated with Lovers Point and the Monterey Breakwater, packages 2 and AC provide the greatest protection. Packages 1 and S provide only low levels of protection in these areas.

N. For the Pinnacles dive area, packages 2, 3, S and AC provide moderate to substantial protection, with packages 2 and AC providing the greatest protection. Package 1 provides the least protection.